MAJOR ARMSTRONG AND CAPTAIN ROUND: THE V24 VALVE

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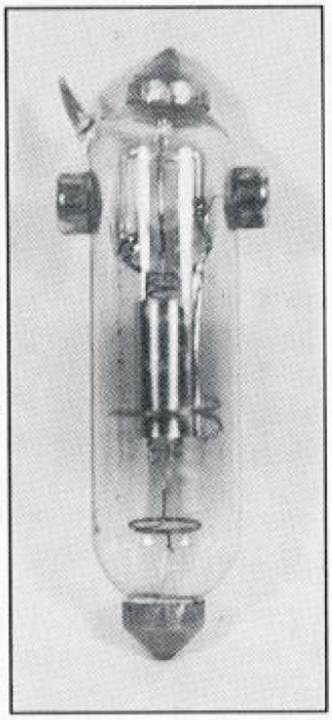
Edwin Armstrong confided to Jess Haydock, in 1937, that he had been delayed enroute from the U. S. via England to his Army billet in the Paris lab of the Signal Corps during the early stages of the U. S. involvement in World War I, and went by train to London from Southampton. Late that evening he hunted up Capt. Henry Round at the Marconi offices.

Knowing Armstrong's interest in HF amplification, Round showed him a 14-stage HF amplifier they had built to intercept inter-ship transmissions from the German fleet. They figured they might copy information of value from enemy ships operating out of the German naval base at Heligoland, near the western entrance to the Kiel Canal. The Germans were using low-powered buzzer-type transmitters on a "short" wavelength (200 meters/1500 kHz), on the theory that interception or direction finding at a distance was impossible. Not so: as it worked out, the Battle of Jutland resulted from the British DF stations detecting a small change in azimuth, indicating the Germans were about to put to sea.



My recollection was that Round used resistance coupling between these 14 stages and Armstrong said he avoided inter-electrode feedback by providing only a small amount of amplification per stage. Armstrong cited a gain of only 2 but the 14 stages provided a significant amount of overall gain and the receiver developed considerable sensitivity.

Armstrong said he "tampered with one of the tuning controls of the amplifier" and a couple of weeks later received a letter from Capt. Round, recounting that he had spent several hours getting it back into alignment! He also said this example of the monstrous job of getting substantial high-frequency amplification caused him to ruminate about other ways to do the job with the available tubes. The idea occurred of first changing the frequency of the signal to some low value and then amplifying the resulting signal. This became the nucleus of the conception of superheterodyne reception.

The Marconi V-24 was used in Capt. Round's 14-stage equipment.

The Tyne Saga of the Vacuum Tube (pages 222-227) covers the Marconi V-24 and its detector companion, the "Q" valve, in some detail. Alan Douglas' paper "Who Invented the Superheterodyne?" in The Legacies of Edwin Howard Armstrong (*Proceedings of the Radio Club of America, Inc.*, Vol. 64, No. 3 (Nov. 1990) includes a diagram of one of Round's DF receivers and other details.